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(71) Applicant
 Alfred Hartkorn,
 Kolpingstrasse 25, 8068
 Pfaffenhofen, Federal
 Republic of Germany

(72) Inventor
 Alfred Hartkorn

(74) Agents
 E. N. Lewis and Taylor,
 144 New Walk, Leicester
 LE1 7JA

(54) Means to span the joint
 between structural members of a
 bridge or like structure

(57) A means for spanning the gap
 between structural members 5, 6 of a
 bridge or other building structure or

spanning other joints comprises a
 body 1 of rubber-resilient material
 which runs the length of the joint and
 is collapsible concertina-fashion to
 keep the upper surface of the means
 at a substantially constant level
 whatever the expansion of this body.
 To accomplish this a middle part of
 the body is cavitated, has upper surface
 notches 31, 32, 34 and side portions
 2 & 3 hinged thereto for fastening to
 adjacent members defining the joint.

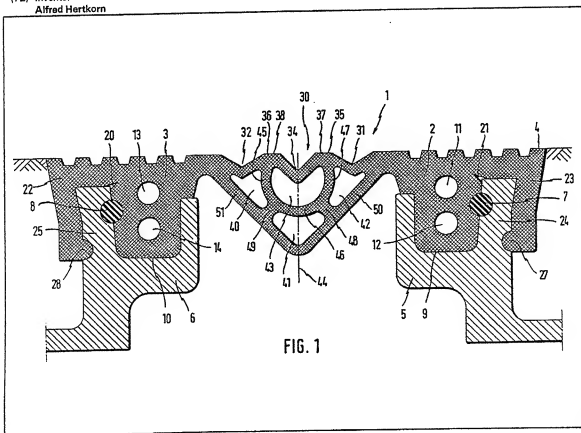


FIG. 1

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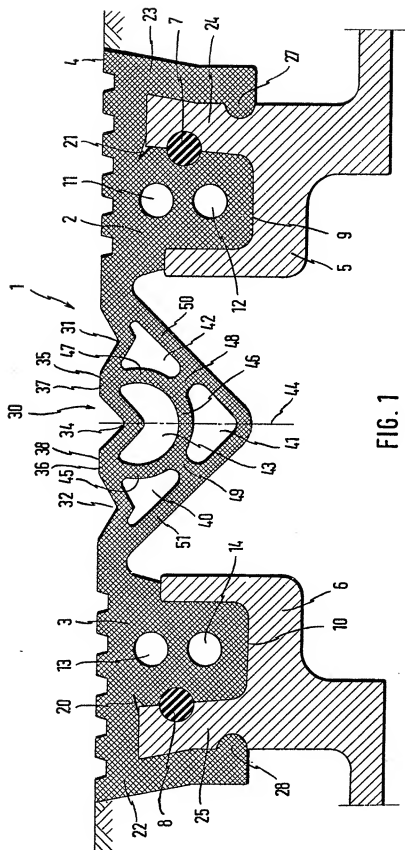


FIG. 1

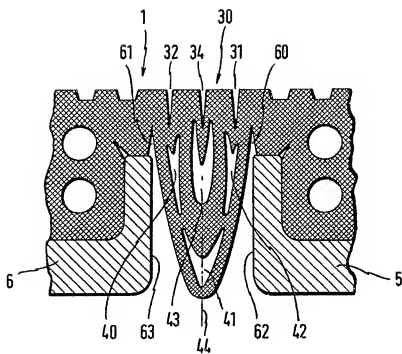


FIG. 2

SPECIFICATION

Means to span the joint between structural members of a bridge or like structure

- This invention relates to means to span the joint between structural members of a bridge or like structure comprising a jointing body of rubber-resilient material running longitudinally and spanning the junction between said members and having a middle part and depending head portions at or adjacent the longitudinal edges thereof for withdrawal-resisting engagement with upwardly open parts of the adjoining structural members.

- Means of the above kind are for example disclosed in German specification OS 2516427 where one section of the means is a skin with a central hinge part carrying at the two sides solid sections which pass over the adjacent structural members or intermediate parts of the structure. A similar closure body for a joint spanning construction is known from German specification AS 2834361, this body being held to the adjacent girders or an intermediate part of the basic structure by means of retaining elements of substantially circular cross-section. In this known arrangement a throughgoing sealing skin again spans the joint.

- It is an object of the present invention to provide a spanning means of the kind first set forth above which is extensible so that it can cover joints of varying width but which is such that the upper surface thereof will remain at substantially the same level at whatever width the joint is set to span.

- In pursuance of this object the middle part of said jointing body is connected to the side head portions through hangers, said middle part being of longitudinally cavitated, triangular cross section and provided at its upper edge with at least two longitudinally extending grooves, notches or the like separated by ribs, humps, or the like.

- The said middle part may be provided with at least three upper grooves, notches or the like which are, for example, of differing depth.

- In a preferred embodiment the said middle part is cavitated by a plurality of channels, for example of differing cross-sectional size, running longitudinally of the joint.

- It is also preferred for at least some of the channels to be located immediately below the grooves, notches, or the like. This facilitates the concertinaing and collapse of the middle part and supports the object of keeping the areas of the middle part between the grooves, notches or the like at the original level, for instance that of a roadway over the bridge. This would then mean that not only is there a suppression of vehicle noise and bumping on the roadway but the incisions left in the latter will be relatively narrow so reducing the risk that a turning vehicle wheel, for example that of a child's bicycle, might be caught during turning or twisting.

- At least two separate channels may be arranged one above the other in said middle part. Advantageously the channels are defined by webs

- of substantially equal thickness protruding into a hollow interior of said middle part. The thickness of the upper wall bounding said hollow interior may be of greater thickness than the webs referred to.

- Preferably the channels and webs are symmetrically disposed relatively to the medial vertical plane of said jointing body.

- In an advantageous arrangement the aforesaid middle part comprises three of said grooves, notches or the like and four said channels, a channel disposed below the middle groove or notch of the three being substantially of a crescent moon shape defined at the bottom by a semicircular web when the jointing body is spread out to cover an enlarged span.

- The jointing body may be physically harder at its upper face than in other parts thereof. To this end for example differing softening agents or plasticisers may be used in producing the jointing body.

- The accompanying drawings illustrate an embodiment of the invention which will now be described. In these drawings:

- Figure 1 is a cross section showing the jointing means straddling a wide gap, and

- Figure 2 shows the middle part of these means collapsed and contracted to fit a smaller gap.

- The jointing means illustrated in the drawings comprises a jointing body generally designated 1 made of rubber resilient material and running the length of the junction between two adjacent structural members 5 and 6. The jointing body has a middle part 30 with adjacent depending side portions 1 and 3 these latter being received in channels 9 and 10 in the members 5 and 6 and being located therein by fastening keys 7 and 8. In the working position illustrated in Figure 1 the upper face 4 of the assembly is shown as flush with what may be regarded as the upper road surface of a bridge but in an alternative environment could for instance be the concrete floor of a market hall.

- The insertion of side portions 2 and 3 in the channels 9 and 10 is facilitated by the provision of circular-section bores in the side portions, viz. bores 11 and 12 in depending portion 2 and bores 13 and 14 in side portion 3. Again the insertion is promoted by corner incisions 20 and 21 in these side portions, and the use of outer flanges 22 and 23 respectively of the body 1 which snap over upstanding parts 24 and 25 of the members 5 and 6 defining the exteriors of the channels 9 and 10 respectively. The lower ends of flanges 22 and 23 carry turned noses 28 and 27 which engage in appropriate recesses in members 5 and 6 to hold the flanges 22 and 23 in working position.

- The middle part 30 of the jointing body is made substantially triangular in cross section and has two outer and upper notches 31 and 32 of V-shape which run in the longitudinal direction of the joint and are of uniform depth throughout. Between them is a middle V-shaped notch 34 of somewhat greater depth.

- In the embodiment illustrated four channels 40

to 43 running in the longitudinal direction of the joint are provided in the middle part 30, these channels, like the notches 31, 32 and 34, being arranged mirror-image fashion in relation to the medial plane 44 of the jointing body.

As shown in the expanded condition of the body in Figure 1, there is an upper central channel 43 of crescent moon shape beneath it a lower central channel 41, and two upper side channels 40 and 42. These channels are defined respectively by webs of body material protruding into a hollow interior of the middle part of the body 1. Thus the upper central channel 43 is defined by webs 45, 46 and 47, channel 41 by web 46 and the lower central wall of the middle part, and side channels by side wall parts 50 and 51 respectively, short webs 48 and 49 respectively from said lower central wall to webs 45—47.

Whilst in the embodiment illustrated all the web sections appear to be of substantially the same thickness — with the exception of the short stubs 48 and 49 — the “undulating” upper edge of the middle part of the jointing body will in practice be made thicker than illustrated. By the same token at least the part of the body 1 associated with the upper edge 4 of the structure in which the jointing means is incorporated will have special attention as regards the composition of the material used therein. Thus for example the part concerned may be of a material such that the part of the body which is traversed, i.e. driven or walked over, is specially wear-resistant. It may for instance use a material which has been proven substantially harder to wear than the tyre material of lorries or other vehicles which may run over it.

Figure 2 gives an illustration of the way the jointing body could be collapsed to cater for a smaller gap between adjacent structural members. The middle part of the jointing means is so-to-speak folded together mirror-image fashion in relation to the medial plane 44 and at the same time is compressed. The folding takes place about the hinges 60 and 61 and the channels 40 to 43 are compressed. The notches 31, 32, and 34 may virtually disappear. The approach together of the opposed faces 62 and 63 of the adjacent girders may be greater than the compression of the middle part 30 because of the effect of the hinges 60 and 61.

Depending on the material of the girders 5 and 6 choice of material in the zone of the channels 40 to 43 the spacing of the girders 5 and 6 may be reduced for example from 100 mm to 25 mm. In many cases an even greater closeness is possible.

CLAIMS

1. Means to span the joint between structural

members of a bridge or like structure comprising a jointing body of rubber-resilient material running longitudinally and spanning the junction between said members and having a middle part and depending head portions at or adjacent the longitudinal edges thereof for withdrawal resisting engagement with upwardly-open parts of the adjoining structural members, in which the middle part of said jointing body is connected to the side head portions, through hangers, said middle part being of longitudinally cavitated, triangular cross section and provided at its upper edge with at least two longitudinally extending grooves, notches or the like separated by ribs, humps, or the like.

2. Means as claimed in claim 1 in which the said middle part is provided with at least three upper grooves, notches or the like which are, for example of differing depth.

3. Means as claimed in claim 1 or 2, in which the said middle part is cavitated by a plurality of channels, for example of differing cross-section size, running longitudinally of the joint.

4. Means as claimed in claim 3, in which at least some of the channels are located immediately below the grooves, notches, or the like.

5. Means as claimed in claim 3 or 4, in which at least two separate channels are arranged one above the other in said middle part.

6. Means as claimed in any of claims 3 to 5, in which said channels are defined by webs of substantially equal thickness protruding into a hollow interior of said middle part.

7. Means as claimed in claim 6 in which the thickness of the upper wall bounding said hollow interior is of greater thickness than said webs.

8. Means as claimed in claim 6 or 7, in which the channels and webs are symmetrically disposed relatively to the medial vertical plane of said jointing body.

9. Means as claimed in any of claims 3 to 8, in which the aforesaid middle part comprises three of said grooves, notches or the like and four said channels, a channel disposed below the middle groove or notch of the three being substantially of a crescent moon shape defined at the bottom by a semicircular web when the jointing body is spread out to cover an enlarged span.

10. Means as claimed in any of claims 1 to 9, in which the jointing body is physically harder at its upper face than in other parts thereof.

11. Means as claimed in claim 10, in which differing softening agents or plasticizers are used in producing the jointing body.

12. Means forming a joint between structural members of a bridge or like structure, substantially as described with reference to and as illustrated in the accompanying drawings.